

REMARKS

This Amendment is submitted with the Applicant's Request for Continued Examination pursuant to 37 C.F.R. §1.114(a).

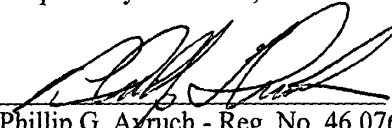
In the Notice of Allowance mailed April 14, 2003, the Examiner allowed the application with claims 1, 6-13, 15-17, 19-26, 28-29 and 31-32. The Applicant has elected to take further action in this application by filing concurrently with this Amendment a Request for Continued Examination, together with payment of the applicable fees. Accordingly, entry of this Amendment and examination of the claims, as amended, is respectfully requested.

In this Amendment, independent claim 1 is amended to include the limitations of dependent claims 8 and 9, and therefore dependent claims 8 and 9 are canceled. Dependent claim 11 is rewritten in independent form to include the limitations of independent claim 1 and dependent claim 12, and therefore dependent claim 12 is canceled. Independent claim 17 is amended to include the limitations of dependent claims 21 and 22, and therefore dependent claims 21 and 22 are canceled. Dependent claim 24 is rewritten in independent form to include the limitations of independent claim 17 and dependent claim 25, and therefore dependent claim 25 is canceled. New claims 33-38 are added to further protect the invention disclosed in the application. Claims 5-7, 15-16, 18-20 and 28-29 remain unchanged.

The applicant believes that the claims, as amended, distinguish over the prior art of record, and that the application is in condition for allowance. Notice of allowance, with claims 1, 5-7, 10-11, 13, 15-20, 23-24, 26, 28-29 and 31-38 is earnestly solicited.

Respectfully submitted,

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Date


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AMENDMENT

(10/025,783)

Amendments to the Claims

Claim 1. (Currently Amended) A method of forming a resist pattern on a semiconductor substrate, comprising:

forming a resist film on the semiconductor substrate;

baking the resist film at a first temperature;

exposing the resist film to light passing through a mask after baking the resist film at the first temperature;

baking the resist film at a second temperature after exposing the resist film to the light, wherein the second temperature is different from the first temperature;

supplying a developing solution on the resist film to remove the resist film, wherein a portion of the resist film remains on the semiconductor substrate; and

rinsing the developing solution from the portion of the resist film by a rinsing liquid to which ultrasonic vibration is applied.

Claims 2-4. (Previously Canceled)

Claim 5. (Previously Added) The method of Claim 1, wherein the ultrasonic vibration ranges from 40 kHz to 50 kHz.

Claim 6. (Previously Added) The method according to claim 1, wherein the developing solution is an alkaline developing solution.

Claim 7. (Previously Added) The method according to claim 6, wherein the alkaline developing solution includes tetramethylammonium hydroxide.

Claim 8. (Currently Canceled)

Claim 9. (Currently Canceled)

Claim 10. (Currently Amended) The method according to claim 9 1, wherein the second temperature is lower than the first temperature.

Claim 11. (Currently Amended) A The method according to claim 1 of forming a resist pattern on a semiconductor substrate, further comprising:

forming a resist film on the semiconductor substrate;

baking the resist film at a first temperature;

irradiating the resist film with an electron beam using an electron beam lithography technique before supplying the developing solution on the resist film after baking the resist film at the first temperature;

baking the resist film at a second temperature after irradiating the resist film with the electron beam, wherein the second temperature is different from the first temperature;

supplying a developing solution on the resist film to remove the resist film, wherein a portion of the resist film remains on the semiconductor substrate; and

rinsing the developing solution from the portion of the resist film by a rinsing liquid to which ultrasonic vibration is applied.

Claim 12. (Currently Canceled)

Claim 13. (Currently Amended) The method according to claim ~~12~~ 11, wherein the second temperature is lower than the first temperature.

Claim 14. (Previously Canceled)

Claim 15. (Previously Added) The method according to claim 1, wherein the ultrasonic vibration is applied to the developing solution.

Claim 16. (Previously Added) The method according to claim 1, wherein the rinsing liquid is pure water.

Claim 17. (Currently Amended) A method for fabricating a semiconductor device, comprising:

preparing a semiconductor substrate;

forming a resist film on the semiconductor substrate;

baking the resist film at a first temperature;

exposing the resist film to light passing through a mask after baking the resist film at the first temperature;

baking the resist film at a second temperature after exposing the resist film to the light, wherein the second temperature is different from the first temperature;

supplying a developing solution on the resist film for patterning the resist film, whereby a patterned resist film is formed on the semiconductor substrate;

providing a rinsing liquid on the semiconductor substrate on which the patterned resist film is formed; and

applying ultrasonic vibration to the rinsing liquid.

Claim 18. (Previously Added) The method according to claim 17, wherein the ultrasonic vibration ranges from 40 kHz to 50 kHz.

Claim 19. (Previously Added) The method according to claim 17, wherein the developing solution is an alkaline developing solution.

Claim 20. (Previously Added) The method according to claim 19, wherein the alkaline developing solution includes tetramethylammonium hydroxide.

Claim 21. (Currently Canceled)

Claim 22. (Currently Canceled)

Claim 23. (Currently Amended) The method according to claim ~~22~~ 17, wherein the second temperature is lower than the first temperature.

Claim 24. (Currently Amended) ~~A~~ ~~The method according to claim 17 for fabricating a semiconductor device, further comprising:~~

preparing a semiconductor substrate;

forming a resist film on the semiconductor substrate;

baking the resist film at a first temperature;

irradiating the resist film with an electron beam using an electron beam lithography technique before supplying the developing solution on the resist film after baking the resist film at the first temperature;

baking the resist film at a second temperature after irradiating the resist film with the electron beam, wherein the second temperature is different from the first temperature;

supplying a developing solution on the resist film for patterning the resist film, whereby a patterned resist film is formed on the semiconductor substrate;

providing a rinsing liquid on the semiconductor substrate on which the patterned resist film is formed; and

applying ultrasonic vibration to the rinsing liquid.

Claim 25. (Currently Canceled)

Claim 26. (Currently Amended) The method according to claim 25 ~~24~~, wherein the second temperature is lower than the first temperature.

Claim 27. (Previously Canceled)

Claim 28. (Previously Added) The method according to claim 17, wherein the ultrasonic vibration is applied to the developing solution.

Claim 29. (Previously Added) The method according to claim 17, wherein the rinsing liquid is pure water.

Claim 30. (Previously Canceled)

Claim 31. (Currently Amended) A method of forming a resist pattern on a substrate, comprising:

forming a resist film on the substrate;

baking the resist film at a first temperature;

exposing the resist film to light passing through a mask after baking the resist film at the first temperature;

baking the resist film at a second temperature after exposing the resist film to the light, wherein the second temperature is different from the first temperature;

supplying a developing solution onto the resist film;

providing a rinsing liquid onto the substrate so as to cover the resist film; and

applying ultrasonic vibration to the rinsing liquid to rinse the developing solution from the resist film submerged in the rinsing liquid.

Claim 32. (Currently Amended) A method of forming a resist pattern on a substrate, comprising:

forming a resist film on the substrate;

baking the resist film at a first temperature;

exposing the resist film to light passing through a mask after baking the resist film at the first temperature;

baking the resist film at a second temperature after exposing the resist film to the light, wherein the second temperature is different from the first temperature;

supplying a developing solution onto the resist film;

supplying the resist film formed on the substrate with a rinsing liquid; and

applying ultrasonic vibration to the rinsing liquid to rinse the developing solution from the resist film submerged in the rinsing liquid.

Claim 33. (New) The method according to claim 11, wherein the ultrasonic vibration is applied to the developing solution.

Claim 34. (New) The method according to claim 11, wherein the rinsing liquid is pure water.

Claim 35. (New) The method according to claim 24, wherein the ultrasonic vibration is applied to the developing solution.

Claim 36. (New) The method according to claim 24, wherein the rinsing liquid is pure water.

Claim 37. (New) A method of forming a resist pattern on a substrate, comprising:
forming a resist film on the substrate;
baking the resist film at a first temperature;
irradiating the resist film with an electron beam using an electron beam lithography technique after baking the resist film at the first temperature;
baking the resist film at a second temperature after irradiating the resist film with the electron beam, wherein the second temperature is different from the first temperature;
supplying a developing solution onto the resist film;
providing a rinsing liquid onto the substrate so as to cover the resist film; and
applying ultrasonic vibration to the rinsing liquid to rinse the developing solution from the resist film submerged in the rinsing liquid.

Claim 38. (New) A method of forming a resist pattern on a substrate, comprising:
forming a resist film on the substrate;
baking the resist film at a first temperature;
irradiating the resist film with an electron beam using an electron beam lithography technique after baking the resist film at the first temperature;
baking the resist film at a second temperature after irradiating the resist film with the electron beam, wherein the second temperature is different from the first temperature;
supplying a developing solution onto the resist film;
supplying the resist film formed on the substrate with a rinsing liquid; and
applying ultrasonic vibration to the rinsing liquid to rinse the developing solution from the resist film submerged in the rinsing liquid.